BEREZOVA, Ye.; BORODULINA, Yu.; BUSHUYEVA, P.; GEL'TSER, F.; GOLIKOV, V.; DOROSINSKIY, L.; KOZLOVA, N.; KRAKHIN, P.; KRUGLOV, N.; LAZAREV, N.; LAMPOVSHCHIKOV, P.; MAKAROVA, M.; MARKOVA, Z.; NESTEROVA, Ye.; PROKHOROV, M.; SOROKINA, T.; STARYGINA, L.; KHUDYAKOV, Ya.

Ivan Il'ich Samoilov; obituary. Mikrobiologiia 28 no.2:318-319 Mr-Ap '59. (MIRA 12:5)

(SAMOILOV, IL'IA IL'ICH, 1900-1958)

[illegible]

Oct 1947

USSR/Engineering
Motor Vehicles
Engines, Gasoline

"Installing a Six-cylinder GAZ-51 into the Chassis of a ZIS-101," V. Golikov, Engr, 1½ pp

"Avtomobil'" No 10

It has been found that the motor for the ZIS-101 is liable to frequent breakdowns. The author has found that, with very slight modification, the six-cylinder motor GAZ-51 produced by the Gor'ki Automobile Factory can be adapted for use in the ZIS-101. The author very briefly describes the installation of one of these motors in the chassis of the ZIS-101.

27T28

LC

GOLIKOV, V.

[illegible]

USSR/Trucks - Parts
Shafts

May 1947

"Reconditioning the Cardan Shaft of a Dodge Truck,"
V. Golikov, Engr, 1 p

"Avtomobil'" Vol XXV, No 5

Method of substituting assembly from GAZ-51 for genuine parts in 4 x 4 Dodge. Diagrams.

12T19

LIBIN, A.L.; MIROLYUBOVA, Z.A.; GOLIKOV, V.G.; FILIPPOVA, L.S., red.;
KHITROVA, N.A., tekhn. red.

[New putty materials for the sealing of freight car bodies] Novye shpaklevochnye materialy dlia uplotneniia kuzovov vagonov. Moskva, Vses.izdatel'sko-poligr.ob"edinenie M-va putei soobshcheniia, 1960. 9 p.
(MIRA 14:12)

(Plastics) (Railroads--Freight cars) (Grain--Transportation) [illegible] Cucurbits.

[illegible]IOLOGIYA NO. 4, 1959. No. 15670

[illegible] Goli[illegible], V.A.
Sci.Res.Inst.of Vegetable Raising
[illegible] of Tomatoes.

[illegible] 1957, No. [illegible], 19-2[illegible]

[illegible] foliar top-dressing [illegible]

[illegible] foliar [illegible]

[illegible] 1/2

GOLIKOV, V.A., kand. ist. nauk; PYLAYEVA, A.F., red.; KOZHAKOVA,
G.N., tekhn. red.

[The most important stage in the development of agricultural
cooperation in the U.S.S.R., 1921-1929] Vazhneishii etap
razvitiia sel'skokhoziaistvennoi kooperatsii v SSSR (1921-
1929 gg.) Moskva, Sel'khozizdat, 1963. 1[illegible] p.
(MIRA 16:12)

(Agriculture, Cooperative)

SLUTSKIY, M.S.; GOLIKOV, V.A.

Growing unity of science and production. Izv. vys. ucheb. zav.; geol. i razv. 7 no.11:3-7 N'64. (MIRA 18:5)

1. Moskovskiy geologorazvedochnyy institut im. S. Ordzhonikidze.

GOLIKOV, V.A.; SLUTSKIY, M.S.

October ideas light the path of the development of science.
Izv.vys.ucheb.zav.; geol.i razv. 8 no.11:3-6 N '65.
(MIRA 18:12)

1. Moskovskiy geologorazvedochnyy institut imeni S.Ordzhonikidze.

1. GOLIKOV, V. G.

2. USSR (600)

7. "The Microflora of Gambo Hemp Retting", Trudy Vsesoyuzn. Nauch.-Issled. In-ta S.-Kh. Mikrobiologii (Works of the All-Union Science-Research Institute of Agricultural Microbiology), Vol 11, No 2, 1951, pp 58-66

9. Mikrobiologiya, Vol XXI, Issue 1, Moscow, Jan-Feb 1952, pp 121-132. Unclassified.

Golikov, V. G.

A new factor stimulating the anaerobic retting of hemp. V. G. Golikov. *Trudy Vsesoyuz. Nauch. Issledovatel. Inst. Sel'skokhoz. Mikrobiol.* 12, No. 2, 83-90(1953); *Referat. Zhur. Khim., Biol. Khim.* 1955, No. 2708.—The new species *Clostridium cannabinum* resembles *C. felsineum* in some respects, also differs from it in some morphological, biochem., and general cultural characteristics. It ferments pectin in sterile infusion of stems of flax and several hemp varieties.

B. S. Levine

CH

[illegible], . .

"Microflora of the Rotting of Hemp and the Effect of Certain Chemical Substances on It." Cand Biol Sci, Leningrad Order of Lenin State U imeni A. A. Zhdanov, Leningrad, 1955. (KL, No 8, Feb 55)

SO: Sum. No. 631, 26 Aug 55-Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (14).

Golikov, V. G.

F-3

USSR/Microbiology. Soil Microbiology

Abs Jour : Ref Zhur-Biologiya, No 1, 1958, [illegible]

Author : Ye. I. Nesterova, V. G. Golikov,
A. N. Nesterova

Inst :

Title : Improvement of the Nutritive Composition of Peat-Humus Pots by Means of Bacterization.

Orig Pub : Dokl. VASKhNIL, 1956, vyp. [illegible], 47-48

Abstract : In preparing composts of a mixture consisting of peat, manure, and phosphorite flour, and the preparation of pots from this mixture bacterization was carried out by azotobacter and by bacteria which break down tricalcium phosphate. On the bacterization of the pots the

Card 1/2

[illegible] : [illegible]
[illegible] : [illegible] Organic Fertilizers.

[illegible] : [illegible]

[illegible] : [illegible]
[illegible] : Institute of Agricultural [illegible]
[illegible] : Effectiveness of Bacteria-[illegible] Composts in
Different Crops.

[illegible] : [illegible]

[illegible] : [illegible] with the application of [illegible] composts at the rate of [illegible] potatoes and winter rye, [illegible] carried out by the Institute of Agricultural Microbiology at sovkhoz "[illegible]" and at the kolkhoz of Leningrad oblast', showed their positive effect on the yields of the crops experimented with. The introduction of azotobacteria into the composition of

[illegible] 1/2

GOLIKOV, V.G., kand.biol.nauk

Mechanism of the positive action of carbon dioxide in retting resistant ambary hemp. Dokl. Akad. sel'khoz. 23 no.4:29-31 '58.
(MIRA 11:5)

1.Vsesoyuznyy nauchno-issledovatel'skiy institut sel'skokhozyaystvennoy mikrobiologii. Predstavleno akademikom I.I. Samoylovym.
(Ambary hemp) (Carbon dioxide) (Retting)

NESTEROVA, Ye.I., kand. biol. nauk,; GOLIKOV, V.G., kand. biol. nauk,;
SHTEYNVOL'F, L.P., kand. biol. nauk

Effectiveness of compost with added bacteria in fertilizing various crops. Dokl. Akad. sel'khoz. 23 no. 5:31-36 '58. (MIRA 11:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut sel'skokhozyaystvennoy mikrobiologii. Predstavleno akademikom I.I.Samoylovym.

(Compost)
(Soil inoculation)

PERTSEVA, A.N.; GOLIKOV, V.G.

Effect of different components of peat composts on the course of microbiological processes during composting. Trudy Vses. inst. sel'khoz. mikrobiol. no.14:133-141 '58. (MIRA 15:4)
(Compost)

GOLIKOV, V.G.

Effect of ammonium carbonate on the anaerobic retting microflora of slow-retting ambary hemp. Trudy Vses. inst. sel'khoz. mikrobiol. no.14:318-332 '58. (MIRA 15:4)
(Ambary hemp) (Retting) (Ammonium carbonates)

Golikov, V.

3(7); 24(3) PHASE I BOOK EXPLOITATION SOV/2528

Leningrad. Glavnaya geofizicheskaya observatoriya

Issledovaniye radiatsionnykh protsessov (Study of Radiation Processes) Leningrad, Gidrometeoizdat, 1959. 1[illegible] p. (Series: Its: Trudy, vyp. 80) Errata slip inserted. 1,200 copies printed.

Sponsoring Agency: Glavnoye upravleniye gidrometeorologicheskoy sluzhby pri Sovete Ministrov SSSR.

Ed. (Title page): V. L. Gayevskiy, Candidate of Geographical Sciences; Ed. (Inside book): V. D. Pisarevskaya; Tech. Ed.: A. S. Sergeyev.

PURPOSE: This book is intended for geophysicists and engineers studying radiation phenomena.

3

COVERAGE: This collection of articles treats problems in optics of the atmosphere and actinometry. Results of theoretical and experimental investigations of visibility range, transparency of the atmosphere, and the radiation regime of both the active surface and the atmosphere are shown. Individual articles deal with the methodology of actinometric observations. No personalities are mentioned. References accompany each article.

Ter - Markaryants, N. Ye. Computing the Albedo of Water Surfaces 4[illegible]

Bareshkova, Ye. P. Certain Regularities in the Regime of Total Radiation 5[illegible]

Bareshkova, Ye. P. Scattered Radiation in Karadag 75

Bareshkova, Ye. P. Computing the Daily Sums of Total Radiation According to Standard Observations 82

Bareshkova, Ye. P. Turbidity of the Atmosphere in Karadag 97

Golikov, V. I. The Problem of Measuring Infrared Radiation With an Instrument Protected by a Polyethylene Windshield 112

Gulyayev, B. I. Spectral Error of Instruments Measuring Plant Radiation 12[illegible]

Gulyayev, B. I. Computing the Cosine Characteristic of Instruments Constructed With a Convex Transparent Glass 13[illegible]

AVAILABLE: Library of Congress

Card 3/3

NM/leb
11-3-[illegible]

6

GOLIKOV, V.I.

Investigating errors of the optical system in the photometry of scattering indicatrices at acute angles. Trudy GGO no.118:51-61 '61. (MIRA 14:8)
(Photometry)

3,5800

S/169/61/000/011/033/065
D228/D304

AUTHOR: Golikov, V.I.

TITLE: Equipment for measuring the dimensional spectrum of spherical particles and droplets of fog

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 11, 1961, 9, abstract 11B72 (Tr. Gl. geifiz. observ., no. 109, 1961, 76 - 89)

TEXT: The description and appraisal of possible sources of error in equipment for studying the size distribution of spherical aerosol particles, rain drops, and other ingredients are given. The equipment's operating principle is based on measuring the angular distribution of light, scattered within a low angle cone around the direction of the main beam, in accordance with K.S. Shifin's method. It is also shown that the described equipment gives a sufficiently accurate determination of the structure of sols in the case of statistically homogeneous systems. [Abstractor's note: Complete translation].

Card 1/1

GOLIKOV, V.I.; KULIGIN, V.A.

At the oldest cotton mill. Tekst. prom. 18 no.5:46-47 Je '58.

(Ivanovo--Cotton manufacture) (MIRA 11:7)

GOLIKOV, Valentin Ivanovich; KUCHEROV, Ivan Konstantinovich; RESINA, Zinaida Fedorovna; KHROMTSOV, Mikhail Ivanovich; MOZHAROVSKIY, S.I., retsenzent; TITKOV, G.G., retsenzent; OBRAZTSOV, S.A., red.; STRATILATOVA, K.I., red.izd-va; PARAKHINA, N.L., tekhn.red.

[Lumbering and woodworking technology] Tekhnologiia lesopil'no-derevoobrabatyvaiushchego proizvodstva. Moskva, Goslesbumizdat, 1960. 383 p. (MIRA 14:4)
(Woodworking industries) (Lumbering)

GOLIKOV, V.I.; TSEKHANOVSKIY, A.I., laureat Stalinskoy premii.

Continuous work schedule in master IA.P. Rymshi's section. Les.prom. 14 no.7:11-13 Jl '54. (MLRA 7:7)

1. Direktor Timiryazevskogo lespromkhoza (for Golikov)
2. Glavnyy inzhener Timiryazevskogo lespromkhoza (for Tsekhanovskiy)
(Lumbering)

GOLIKOV, V.I.

Geodesic mapping of gravitational fields of the general type.
Trudy Sem.po vekt.i tenz.anal. no.12:97-129 '63. (MIRA 16:6)
(Spaces, Generalized) (Gravitation)

GOLIKOV, V.I.

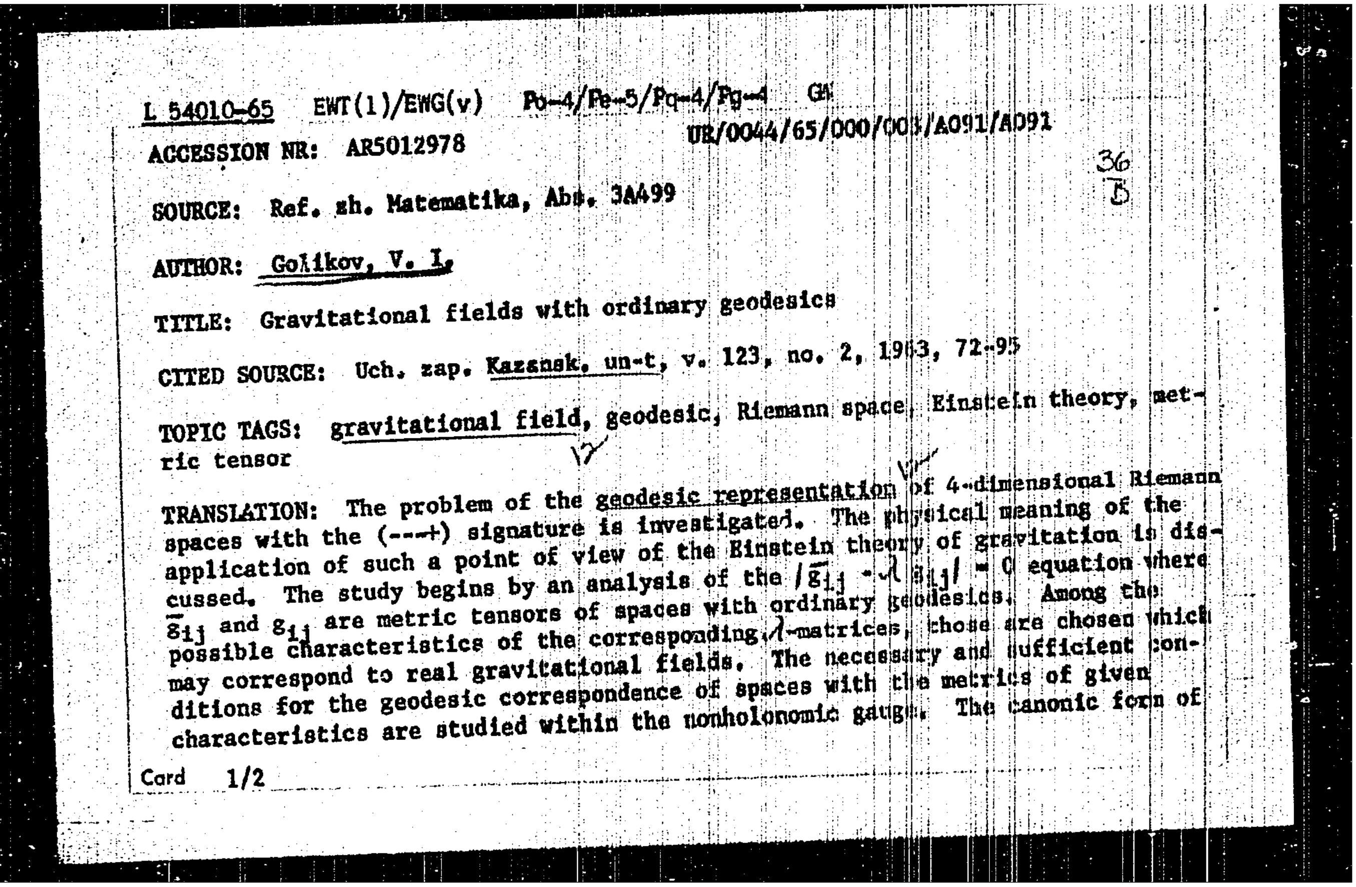
Gravitational fields with general geodesics. Part 2. Uch. zap. Kaz. un. 123:59-67 '63.
(MIRA 17:11)

GOLIKOV, V.I.

Classification of gravitational fields with general geodesics by types suggested by Petrov. Uch. zap. Kaz. un. 123 no.12:26-43 '63.
(MIRA 17:11)

[illegible] [illegible] Ivanovich; [illegible]INA, Zinaida Fedorovna; [illegible]KOV, V, N. P., red.

[Intensification of veneering and gluing operations in the manufacture of furniture] Intensifikatsiia fanerovochnykh i kleevochnykh rabot v proizvodstve mebeli. Moskva, Izd-vo "Lesnaia promyshlennost'," 19[illegible] 11[illegible] p. (MIRA [illegible])



L 54010-65 EWT(1)/EWG(v) Po-4/Pe-5/Pq-4/Pg-4 GW

UR/0044/65/000/003/A091/A091

ACCESSION NR: AR5012978

36
B

SOURCE: Ref. zh. Matematika, Abs. 3A499

AUTHOR: Golikov, V. I.

TITLE: Gravitational fields with ordinary geodesics

CITED SOURCE: Uch. zap. Kazansk. un-t, v. 123, no. 2, 1963, 72-95

TOPIC TAGS: gravitational field, geodesic, Riemann space, Einstein theory, metric tensor

TRANSLATION: The problem of the geodesic representation of 4-dimensional Riemann spaces with the (---+) signature is investigated. The physical meaning of the application of such a point of view of the Einstein theory of gravitation is discussed. The study begins by an analysis of the $|\bar{g}_{ij} - \lambda g_{ij}| = 0$ equation where $\bar{g}_{ij}$ and g_{ij} are metric tensors of spaces with ordinary geodesics. Among the possible characteristics of the corresponding λ-matrices, those are chosen which may correspond to real gravitational fields. The necessary and sufficient conditions for the geodesic correspondence of spaces with the metrics of given characteristics are studied within the nonholonomic gauge. The canonic form of

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ACCESSION NR: AR5012978

the metric of geodesically-corresponding spaces representing gravitational fields formulated in a holonomic coordinate system is found. M. Yakupov

SUB CODE: MA, ES ENCL: 00

Card 2/2

ACCESSION NR: AT4033571 S/2922/63/009/000/0277/0284

AUTHOR: Shifrin, K. S.; Golikov, V. I.

TITLE: A method and instrument for determination of the microstructure of clouds and precipitation

SOURCE: Vsesoyuznoye nauchnoye meteorologicheskoye soveshchaniye. 1st, Leningrad, 1961. Pribory* i metody* nablyudeniy (Instruments and methods of observation); trudy* soveshchaniya, v. 9. Leningrad, Gidrometeoizdat, 1963, 277-284

TOPIC TAGS: meteorology, meteorological instrument, cloud, cloud structure, fog

ABSTRACT: This article presents the results of development of an optical method for measurement of the microstructure of large-drop clouds and fogs. The method and instrument discussed are based on an analysis of information on the properties of a semidispersive system of cloud and fog drops which is contained in the sectors of the indicatrix corresponding to small scattering angles. The instrument developed for this purpose is the field diffraction structure meter shown in Fig. 1 of the Enclosure. In natural fogs the instrument operates with a modulated signal without a suction device, thereby making it possible to realize the basic advantage of optical methods for measurement of the microstructure of fogs: collection of primary information without mechanical distortions of state of the

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ACCESSION NR: AT4033571

medium. The instrument is designed to measure drops with a radius of 2-40 μ and minimum concentrations of about 100-50 drops per cubic centimeter. The recording of I (β) is accomplished with an automatic PS1-02 electronic potentiometer or a K4-51 photorecorder. The error in photometric measurement of the intensity of scattered light for minimum light fluxes is 10^{-9} lux is no greater than 10%. The instrument was tested in natural fogs in May 1960 at Voyeykovo. The time expended in obtaining one spectrum was from 30 minutes to 1 hour; this required introduction of a special computing device into the photometer electrical system. The computing device decreases the time for computing I (β), increases the accuracy of measurement, and in the process of collection of primary information makes it possible to evaluate the quality of the record of I (β) and its suitability for subsequent processing. Orig. art. has: 5 figures.

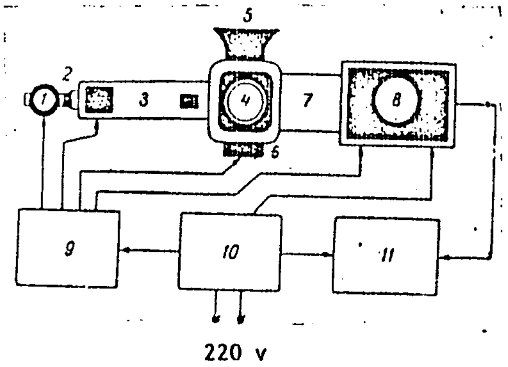
ASSOCIATION: Glavnaya geofizicheskaya observatoriya (Main Geophysical Observatory)

SUBMITTED: 00	DATE ACQ: 16Apr64	ENCL: 01
SUB CODE: ES	NO REF SOV: 007	OTHER: 001

Card 2/3

ACCESSION NR: AT4033571

ENCLOSURE: 01



Block diagram of the field diffraction structure meter.
1 - light source; 2 - condenser; 3 - collimating lens; 4 - chamber; 5 - suction device; 6 - fan; 7 - light detector; 8 - scanning device, photometer amplifier; 9 - instrument control panel; 10 - power source; 11 - recorder and computing device.

Card 3/3

L 24428-65 EWT(1)/FCC GW S/0169/64/000/009/B011/B011

ACCESSION NR: AR4047585

8

B

SOURCE: Ref. zh. Geofizika, Abs. 9B89

AUTHOR: Shifrin, K. S.; Golikov, V. I.

TITLE: Method and instrument for determining the microstructure of clouds and fogs

CITED SOURCE: Tr. Vses. nauchn. meteorol. soveshchaniya, 1961. T. 9. L., Gidrometeoizdat, 1963, 277-284

TOPIC TAGS: meteorological instrument, cloud, fog, cloud physics, fog physics, cloud droplet, artificial fog, cloud chamber

TRANSLATION: The method and instrument were based on an analysis of information on the properties of a polydisperse system of drops contained in small angles of the indicatrix of scattering. There is a single-valued relationship between the sizes of the particles at small angles. The authors present formulas which make it possible to use the measured angular distribution of light scattering to determine the drop-size distribution. The instrument is a photometer consisting of a collimater and an entrance objective in whose focal plane there is a moving light detector with a point diaphragm for measurement of the angular distribution

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ACCESSION NR: AR4047585

of scattered light. Using this instrument, it is possible to measure the drop-size distribution in artificial fogs in a cloud chamber. The drop-size distributions obtained by the small angles method using this instrument were compared with the distributions found using flow traps. The microstructure of surface fogs was measured. It was found from theoretical computations and experimental data that the ordinates of the drop-size distribution are determined by the optical method with an accuracy to ±5% near the maximum and ±20-25% near the base of the drop-size distribution curve. The article includes the parameters of the measuring system of the instrument and discusses the difficulties in analysis of the experimental data and the possibilities of its automation. V. Golikov

ASSOCIATION: None

SUB CODE: ES ENCL: 00

Card 2/2

GUREVICH, S.I., kand. tekhn. nauk [illegible], [illegible] nauk;
ANISIMOV, Yu. [illegible], [illegible]

Increasing efficiency potential of output gears of [illegible] reducers.
Trudy MATI no.6? 108-118 '64. [illegible]

L 8902-65 EWT(l)/FCC ESD(t)/SSD/AFWL GW

ACCESSION NR: AT4040734 S/2531/64/000/152/0142/0159

AUTHOR: Golikov, V. I.

B

TITLE: Device for measuring the microstructure of clouds and fogs using the method of small angles

SOURCE: Leningrad. Glavanaya geofizicheskaya observatoriya. Trudy*, no. 152, 1964. Issledovaniya radiatsionny*kh protsessov (Investigations of radiation processes), 142-159

TOPIC TAGS: cloud microstructure, fog microstructure, small angle measurement, diffraction optics, photometer, electrical photometer

ABSTRACT: The author discusses a field model of an optical device, designed and built by the Glavnaya geofizicheskaya observatoriya (Main Geophysical Observatory) in 1959, for determining the structure of clouds and fog using the method of small angles. The device, intended primarily for work with ground fog, incorporates an electrical photometer. Problems related to the design of the optical and electrical systems of the device, its construction, and its principal parameters are examined. Formulas used in processing indices obtained

Card 1/2

L 8902-65

ACCESSION NR: AT4040734

0

both from cloud-chamber and field operations are analyzed. Orig. art. has: 5 figures, 3 tables, and 40 formulas.

ASSOCIATION: none

SUBMITTED: 00 ATD PRESS: 3105 ENCL: 00

SUB CODE: ES NO REF SOV: 017 OTHER: 000

Card 2/2

GOLIKOV,V.I.

Shaving small-module spur gear wheels. Priborostroenie no.11:15-17 N '56. (MIRA 10:1)

(Gear cutting)

GOLIKOV, V.I., kand.tekhn.nauk

Grinding low-module spur gears. Av.prom. 26 no.8:29-36 Ag '57. (MIRA 15:4)

(Gear cutting)

Golikov V.I

25(6) PHASE I BOOK EXPLOITATION SOV/1328

Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy promyshlennosti.
Leningradskoye oblastnoye pravleniye

Vzaimozamenyayemost', tochnost' i metody izmereniya v mashinostroyenii
(Interchangeability, Accuracy and Measuring Methods in Machine
Building) Moscow, Mashgiz, 1958. 251 p. (Series: Its: Sbornik,
kn. 47) 6,000 copies printed.

Eds.: Kitay, A.K., Candidate of Technical Sciences, Docent; Puzanova,
V.P., Candidate of Technical Sciences; Kempinskiy, M.M., Engineer;
Rubinov, A.D., Candidate of Technical Sciences; Turetskiy, I. Yu.,
Candidate of Technical Sciences; and Abadzhi, K.I., Engineer; Ed.
of Publishing House: Simonovskiy, N.Z.; Tech. Ed.: Sokolova, L.V.;
Managing Ed. for Literature on Machine Building Technology (Leningrad
Division, Mashgiz): Naumov, Ye. P., Engineer.

PURPOSE: This book is intended for plant engineering, scientific and
technical personnel and production innovators. It may also be

Card 1/6

Interchangeability, Accuracy and Measuring Methods (Cont.) SOV/1328

useful to students of higher technical institutes.

COVERAGE: This collection of articles deals with the topics discussed at the Third Leningrad Scientific and Engineering Conference on Interchangeability, Accuracy, and Inspection Methods in Machine-building and Instrument-making, held March 18-22, 1957. The book consists of three parts: 1) interchangeability in machine-building and instrument-making 2) manufacturing accuracy and quality control 3) engineering measurements. The first part deals with basic principles of interchangeability, estabishment of the system and calculation of tolerances. The second part deals with calculation and analysis of the accuracy of manufacturing processes, machine subassemblies and quality control. The third part consists of articles dealing with improvements in measuring instruments and methods. Special emphasis is placed on the measurement of large parts. A new method of calculating accuracies of measuring instruments is discussed in the article by M.M. Kempinskiy. There is no bibliography.

Card 2/9

Interchangeability, Accuracy and Measuring Methods (Cont.) SOV/1328

Golikov, V.I. (Moscow). System of Tolerances for Spur Gear Hobbing-cutters With 0.15-1 MM Modules 32

Il'inskiy, S.A. (Moscow). Experience Using a System of Tolerances and Fits in Manufacturing Wooden Products 42

Izhevskiy, M.N. (Leningrad). Practice Calculating Dimension-chain Systems 45

Puzanova, V.P. (Leningrad). Some Problems in Constructing Dimension-chain and Dimensioning Parts on Drawings 53

Tylevich, I.N. (Leningrad). Dimensional Tolerances in Ship Systems and Pipelines 60

Goryachev, A.S. (Kuybyshev). Securing the Interchangeability of Flange-jointed Machine Units 71

Card 4/9

GOLIKOV, V.I. (Moskva)

Tolerances for hobbing cutters used in cutting spur gears having modules from 0,15 to 1 mm. [Izd.] LONITOMASH 47:32-41 '58.
(Gear-cutting machines--Standards) (MIRA 11:10)

PHASE I BOOK EXPLOITATION SOV/4597

Nauchno-tekhnicheskoye obshchestvo priborostroitel'noy promyshlennosti

Priborostroyeniye i izmeritel'naya tekhnika (Instrument Manufacture and Measurement Technique) Moscow, Mashgiz, 1960. 462 p. Errata slip inserted. 3,000 copies printed.

Ed.: A.N. Gavrilov, Doctor of Technical Sciences, Professor; Tech. Ed.: A. Ya. Tikhanov; Managing Ed. for Literature on Machine and Instrument Construction (Mashgiz): N.V. Pokrovskiy, Engineer.

PURPOSE: This collection of articles is intended for scientific and technical personnel in the instrument industry.

COVERAGE: The 23 articles deal with the present state and the outlook for the development of instrument manufacture and measurement technique. New problems of design, construction, and manufacture of instruments are discussed in the first two sections. Emphasis is given to problems of automation and mechanization of production and to the application of new techniques in program control, ultrasonics, and chipless working of metals. The third section deals with new measurement methods involving the use of ultrasonics and radio isotopes. Some theoretical aspects of metrology and measurement technique are also discussed in this section. No personalities are mentioned. References accompany several of the articles.

Urazayev, Z.F., Candidate of Technical Sciences. Effect of Loading on the Friction Moment of Ball Bearings Used in Gyroscopic Instruments 77

Tykholtsev, N.A., Candidate of Technical Sciences. Estimating the Magnitude of Backlash in Small-Module Spur Gearing Used in Servo Systems 91

Orkner, M.A., Candidate of Technical Sciences. Conditions for Improving the Stability of Magnetoelectric Instruments 100

Goncharskiy, L.A., Candidate of Technical Sciences. Electronic Transducers of Mechanical Values and Their Application 115

MANUFACTURING METHODS AND DESIGN

Chernyshev, A.V., Engineer. Application of Program Control in Instrument Manufacture 139

Gavrilov, A.N., Doctor of Technical Sciences, Professor, A.N. Kurapov, Candidate of Technical Sciences, and B.A. Dukhlov, Candidate of Technical Sciences. Increasing the Accuracy of Machining on Automatic Lathes and Widening Their Field of Application 162

Gentman, S.A., Candidate of Technical Sciences, V.V. Kolobov, Engineer, and K.A. Kuznetsov, Engineer. Some Ways of Reducing Labor Consumption in the Manufacture of Dies for Cold Pressworking in Instrument Manufacture 180

Yermolayev, P.D., Engineer. Cold Pressworking of Metals in Small-Lot Production 201

Kurnyavko, V. Kh., Engineer. Use of Ultrasonics in Instrument Manufacture 209

Kruglov, A.S., Engineer. Methods of Calibrating Profilometer Scales 235

Galitsev, V.Ye., Candidate of Technical Sciences. Fundamentals of the Calculation for Accuracy in the Machining of Small-Module Gears 255

Maksimikhin, S.A., Engineer. Recent Developments in the Technology of Brazing of Parts in Instrument Manufacture 272

Card 4/6

S/272/63/000/002/004/009
E032/E114

AUTHORS: Shifrin, K.S., and Golikov, V.I.

TITLE: Determination of the droplet spectrum by the small-angle method

PERIODICAL: Referativnyy zhurnal, otdel'nyy vypusk, Metrologiya i izmeritel'naya tekhnika, no.2, 1963, 50-51, abstract 2.32.354. (In collection: Issled. oblakov, osadkov i grozovogo elektrichestva (Studies of clouds, precipitations and thunderstorm electricity), M., AN SSSR, 1961, 266-277)

TEXT: A method is described for determination of the microstructure of clouds and mist from the change in the intensity of light scattered at small angles. A description is also given of laboratory apparatus for the realization of this method. The light source in this apparatus is a type СВДШ-250 (SVDSh-250) lamp with a stabilized supply source. A condenser lens of 9 cm focal length is used to direct the radiation from the lamp onto a narrow-band interference filter with λ_{max} = 546 mμ and focus it

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on an iris diaphragm reduced to a minimum aperture of about 0.25 mm. A collimating lens with f = 20 cm and a diameter of 6 cm is used to produce a parallel beam of light. It was possible to obtain a minimum divergence of 5' with these lens parameters. The existing diaphragm ensures the necessary beam diameter and limits the amount of light scattered by the lens. Plane parallel specimens or containers are fixed on a special table immediately in front of the diaphragm. It is followed by a further lens with f = 35 cm and a diameter of 5 cm. The photomultiplier diaphragm of 1.3 mm diameter is placed at the focus of the latter lens and the output of the photomultiplier is fed into an amplifier. An СД-2 (SD-2) synchronous motor is used for continuous displacement of the photomultiplier and the diaphragm over a path of 10 cm. The entire apparatus is placed in a room with black walls and ceiling. Auxiliary screens and diaphragms are used to exclude extraneous light. With the above optics parameters the apparatus has an angular resolution of $\beta = 2.5 - 5'$ and a minimum angle of approach to the zero angle direction of $\beta_{limit} = 13'$. The indications are read-off from a

Determination of the droplet ... S/272/63/000/002/004/009
E032/E114

graduated dial and recorded by a ПСР -01 (PSR-01) potentiometer on a chart. A complete record of the curve is obtained in 10-15 min for plane parallel specimens. The results are given of a comparison between the small-angle and microphotographic methods. It is shown that the accuracy of the two methods is 20-25% and 25-30% respectively. The limitations of the methods are enumerated. They are: 1) the scattering particles should not be too densely packed so that interference phenomena may be excluded; 2) the optical thickness of the illuminated volume should be much less than 1 in order to prevent secondary scattering for which the theory does not hold; 3) the maximum particle radius is limited by the minimum value of β_{limit} at which measurements begin, i.e. by the radius of the central spot in the focal plane of the final lens (in this apparatus $\beta_{limit} \simeq 4{-}3$ radians). Hence, the maximum particle radius is $a_{max} = 100\ \mu$. 4) The minimum particle radius determined from exact calculations is found to be 2 μ. 14 figures. 3 references.

Card 3/3 [Abstractor's note: Complete translation.]

BELEVTSEV, A.T., kand. tekhn. nauk; GOLIKOV, V.I., kand. tekhn. nauk; GOTSERIDZE, R.M., inzh.; YEFIMOV, V.P., kand.tekhn. nauk [deceased]; KOPANEVICH, Ye.G., kand. tekhn. nauk; MALOV, A.N., prof.; PARFENOV, O.D., kand. tekhn. nauk; ROZENBERG, A.G., tekhn.; SEMIBRATOV, M.N., kand. tekhn. nauk; SKURATOV, A.Ye., kand. tekhn. nauk; SOKOLOVSKIY, I.A., kand. tekhn.nauk; SYROVATCHENKO, P.V., kand. tekhn.nauk; TISHCHENKO, O.F., doktor tekhn. nauk; USHAKOV, N.N., kand. tekhn. nauk; CHUMAKOV, V.P., kand. tekhn. nauk; SHAL'NOV, V.A., kand. tekhn.nauk; SHISHKIN, V.A., kand. tekhn.nauk; YUZHNYY, I.I., inzh.; BLAGOSKLONOVA, N.Yu., red. izd-va; SOKOLOVA, T.F., tekhn. red.

[Manual for engineers in the instrument industry]Spravochnik tekhnologa-priborostroitelia. Pod red. A.N.Malova. Moskva, Mashgiz, 1962. 988 p. (MIRA 16:2)

(Instrument manufacture)

L 27863-65 EWT(l)/EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(k)/EWP(b) MJW/JD/EM

ACCESSION NR: AT5001357 S/2536/64/000/060/0108/0118

AUTHOR: Gurevich, S.I. (Candidate of technical sciences, Docent); Golikov, V.I. 30 (Candidate of technical sciences); Anisimov, Yu. P. (Engineer) 27

B+1

TITLE: Increasing the efficiency potential of the output gears of steering mechanisms 17

SOURCE: Moscow. Aviatsionnyy tekhnologicheskiy institut. Trudy, no. 60, 1964. Povysheniye resursa raboty aviatsionnykh detaley tekhnologicheskimi sredstvami (Increasing the efficiency potential of aircraft parts by technological procedures), 108-118 4 4

TOPIC TAGS: gear production, aircraft part endurance, steel heat treatment, steel hardness, automatic pilot, gear wear, steering mechanism, wear resistance, steel 18KhGT, steel 38KhMYuA 16

ABSTRACT: The authors note that in connection with the improved flight characteristics of modern aircraft, a 3000-4000-hour operating potential must be provided for the various assemblies and mechanisms, in particular for the steering mechanisms. The results of static tests of the steering mechanism of series-produced automatic pilots show that, because of heavy wear, the mean lifetime of the gears is only 500 hrs. or 12-17% of the required period. For this reason, the basic problem in increasing the operating potential of the steering mechanism is to increase the wear resistance of the rubbing surfaces of

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the gear teeth. The present article discusses the results of work aimed at increasing this potential only for the output gears of the steering mechanism, which are the ones subjected to the heaviest load and whose teeth wear is primarily responsible for the sum play or backlash of the transmission system. The principal object of the investigation was the straight-toothed output spur gears of an autopilot steering mechanism. The basic geometrical parameters of the gear pair are given in a special table. Reasons are adduced explaining why profile wear of the teeth is the primary cause of output gear failure in the autopilot steering mechanism. It is also shown that in the engagement of the pair of gears under consideration, the effective speeds are very low in comparison with profile slippage, attesting to the unfavorable operating conditions in the actual engagement. This leads to increased tooth wear — a fact confirmed by the results of the experimental investigations carried out in this work. In order to increase the effective service life and wear-resistance of the output gear pair of the steering mechanism, experiments were conducted on the selection of the best type of steel and its most suitable chemical-thermal treatment. These investigations, the preliminary nature of which is stressed by the authors, led to certain recommendations contained in tabular form in the article. The new technical process advanced in the paper for the processing of the teeth is shown to be relatively productive, stable and capable of providing gears having the required accuracy, surface finish and hardness on the lateral working surfaces

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ACCESSION NR: AT5001357

of the teeth. A complete description is given in the article of how the tests were carried out and the results collated. Among the more important conclusions reached by the authors are the following: 1. Satisfactory wear-resistance in the gears of a steering mechanism, ensuring an operational potential of 2000-3000 hours, is possible if there is an HRS hardness value for the working surfaces of the engaging teeth of 60 or better; 2. The approximate potential of gears manufactured in accordance with the experimental technology discussed in the article can be taken as equal to 1500-2000 hours (2-3 times that of the existing steering mechanism potential); 3. Steering mechanism gears of high load capability and wear-resistance can be produced from types 38KhMYuA and 18KhGT steel, using the chamical-thermal treatment and modern production methods for teeth processing described in this article. Specifically, the initial lateral gap should be reduced to 8-15 angular minutes, and the play in the entire reducer should be within the limits of 13-22 angular minutes. Orig. art. has: 3 tables and 4 figures.

ASSOCIATION: Moskovskiy aviatsionnyy tekhnologicheskiy institut (Moscow aeronautical engineering institute)

SUBMITTED: 00 ENCL: 00 SUB CODE: AC, IE

NO REF SOV: 005 OTHER: 000

Card 3/3

L 3886-66 EWT(1)/FCC GW

ACCESSION NR: AT5025233 UR/2531/65/000/170/0127/0139

27
24
B+1

AUTHOR: Shifrin, K. S.; Golikov, V. I.
44,55 44,55

TITLE: An instrument for measuring particle spectra by the small angle method

SOURCE: Leningrad. Glavnaya geofizicheskaya observatoriya. Trudy, no. 170, 1965. Issledovaniye radiatsionnykh protsessov v atmosfere (Investigation of radiation processes in the atmosphere), 127-139

TOPIC TAGS: aerosol, particle spectrum, photometric analysis

ABSTRACT: A model of a field instrument for measuring the microstructure of mists 12,44,55 by the small angle method was built at the Main Geophysical Observatory in 1959-1960. The instrument was tested using aerosol models in the cloud chamber of the High-Altitude Geophysics Institute 44,55 (Terskol) and in natural mists (Voyeykovo). The spectra taken with this device coincide satisfactorily with those of flow-type collectors and photomicrographs. The tests made in 1959-1960 showed that fluctuations in the spectrum of water drops in space and time make it difficult to evaluate the accuracy of measurements when working with mists. Therefore more detailed studies of the instrument were made using artificial aerosol models of known microstructure. These

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studies were made in 1961-1963. The aerosol models and photometric methods are described. Measurements with a special instrument showed that the photometric data obtained in these tests were accurate to better than 10%, reaching 1% in favorable circumstances. The results of tests with plane and volumetric aerosol models are analyzed and the spectra obtained by optical and photomicrographic methods are compared. It is found that the optical method gives completely satisfactory results. As a first step toward automatic analysis of the experimental data, the "Ural-1" computer was programmed for taking the spectra of a number of aerosol models. Plans are being made to design an analog or analog-digital computer for automatic analysis of these data. Orig. art. has: 2 figures, 10 formulas, 1 table.

ASSOCIATION: Glavnaya geofizicheskaya observatoriya (Main Geophysical Observatory)

44,55

SUBMITTED: 00 ENCL: 00 SUB CODE: ES

NO REF SOV: 009 OTHER: 000

Card 2/2

L 3887-66 EWT(1)/FCC GW
ACCESSION NR: AT5025234 UR/2531/65/000/170/0140/0148

32
39
B+1

AUTHOR: Golikov, V. I.
44,55

TITLE: Improvement of an instrument for measuring microstructure by the small angle method

SOURCE: Leningrad. Glavnaya geofizicheskaya observatoriya. Trudy, no. 170, 1965. Issledovaniye radiatsionnykh protsessov v atmosfere (Investigation of radiation processes in the atmosphere), 140-148

TOPIC TAGS: aerosol, photometry, fog

ABSTRACT: The author describes changes made to improve an instrument for measuring the microstructure of fogs and aerosols. 12,44,55 These improvements were found to be necessary after tests of the instrument in 1959-1961. The accuracy of photometric measurement and the angular resolution of the instrument were improved, especially at small β (near 0°), by expanding the range of the scanning rates with respect to β. A set of special cells was made for calibrating the device and for operation with plane and volumetric aerosol models. A study of various systems of small-angle photometers showed that the overall dimensions of the instrument can be considerably

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reduced, particularly if experimental conditions make it possible to limit the range of particle sizes and concentrations to be measured. A photograph of the entire device is shown together with a schematic diagram of the power supply unit. The unit is designed for measuring the microstructure of ground-level fogs with α = 2-30 μ. The light beam of the instrument is parallel to within 5', the angular resolution of the photometer α = 8-10', the beam diameter is 0.3-3 cm, the maximum angle for capture of the scattered light by the receiver $\beta_{max} = 11^{\circ}$, the total time for recording of the indicatrix may be varied from 1 to 20 minutes, the range of luminous fluxes which can be measured (ratio of maximum to minimum flux) is 10^4, the accuracy of photometric measurement of the indicatrix is from 1 to 10%, focal lengths of the receiver objective are 12.5, 36, 72 and 93 cm. Other important parameters of the instrument are given. The method of calibration and the operation of the instrument are described. Measurement errors are analyzed. A computer attachment is proposed for reducing time and labor in analyzing the measurement data. The block diagram of this device is shown. Orig. art. has: 4 figures, 8 formulas.

ASSOCIATION: Glavnaya geofizicheskaya observatoriya (Main Geophysical Observatory)

44,55

SUBMITTED: 00 ENCL: 00 SUB CODE: ES

NO REF SOV: 006 OTHER: 000

Card 2/2

GOLIKOV, V.I.

Improvement of an instrument for measuring a microstructure by means of small angles. Trudy GGO no.170:141-148 '65.

(MIRA 18:9)

GOLIKOV, V.I. [Holikov, V.I.]

Role of machinery in lowering the production cost of grain on state farms. Visnyk AN URSR 29 no.1:37-48 Ja '58. (MIRA 11:4)
(Ukraine--Farm mechanization) (Grain)

GOLIKOV, Vladimir Ivanovich [Holikov, V.]; ONISHCHENKO, Aleksey
Moiseyevich [Onyshchenko, O.]; SKLYARENKO, O., red.;
MIL'KIN, Yu., tekhn. red.

[Cost of farm produce and how to reduce it] Sobivartist' sil's'kohospodars'koi produktsii i shliakhy ii znyzhennia. Kyiv, Derzh.vyd-vo polit.lit-ry URSR, 1960. 70 p. (MIRA 15:1)
(Ukraine—Farm produce)

GOLIKOV, Vladimir Ivanovich [Holykov, V.I.]; PERSHIN, P.M. [Pershyn, P.M.], akademik, otv.red.; KOZAKEVICH, T.A. [Kozakevych, T.A.], red.; BUNIY, R.O., tekhn.red.

[Ways to reduce the costs of state farm production] Shliakhy znyzhennia sobivartosti radhospnoi produktsii. Kyiv, Vyd-vo Akad.nauk URSR, 1960. 105 p. (MIRA 15:5)

1. AN USSR (for Pershin).
(Ukraine—State farms—Costs)

GOLIKOV, V.M., inzhener

Compensation devices for low-capacity condensers. Leg.prom. 15 no.5:
28-29 My '55. (MIRA 8:7)
(Condensers (Electricity))

Golikov, V.M.

Metl

Determination of Diffusion Coefficients of Elements in Ferrite with Aid of Radioactive Isotopes. V. M. Golikov and V. T. Borisov. (Zavodskaya Laboratoriya, 1955, 21, (7), 824-827). [In Russian]. The theory of diffusion-coefficient determination in ferrite with the aid of radioactive isotopes is considered and ways of allowing for processes occurring in the deposited radioactive layer are described. The technique was used for studying the self-diffusion of iron in an iron-chromium alloy. Values of diffusion coefficient were obtained at annealing temperatures of 850-1100° C and gave an activated energy higher than for pure iron.—S. K.

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Central Sci-Res. Inst-Ferrous Metallurgy

Golikov, V. M.

4
1-4E2c

The Determination of the Coefficients of Volume- and Grain-Boundary-Diffusion of Metals. V. T. Borisov, V. M. Golikov, and B. Ya. Lyubov (Izvest. Akad. Nauk S.S.S.R., 1956, (Tekhn.), (10), 37-47).—[In Russian]. The absorption method was used. The relative change of the integral activity is greater at higher temp. This is satisfactorily explained by theory and makes possible an analysis of the distribution of diffusion. The diffusion curves show three stages: (1) with a small gradient; (2) with a greater gradient; and (3) a smaller gradient again. In the first stage, there is a simultaneous transport of material both within the grain and across the grain boundary. The change in concentration (and hence the slope of the curve) is determined by the diffusion within the crystal, the magnitude of which is much greater than that by grain-boundary diffusion. Thus there is an increase in vol. at the part of the crystal adjacent to the surface layer, which results in a decrease of diffusion within the crystal. The diffusion through the boundaries is as before. At this stage the rate of change of concentration is determined by complex factors. The transition from the first to the second stage is slow for low temp. In stages (2)-(3), all the transported material is absorbed through the grain boundary, and the rate of change of concentration is again dependent on the coeff. of vol. diffusion; it is greater at higher temp. [illegible]—V. E. R.

E-6

Category : USSR/Solid State Physics - Diffusion. Sintering

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 1246

Author : Borisov, V.T., Golikov, V.M.
Inst : Central Scientific-Research Inst. for Ferrous Metallurgy, USSR
Title : On the Theory of the Radiography Method for the Measurement of Diffusion Parameters.

Orig Pub : Zavod. laboratoriya, 1956, 22, No 2, 178-18

Abstract : A mathematical analysis is given for certain laws of diffusion near the separation boundary between two grains. The results are employed to process experimental data previously published, obtained by using radiography and metallographic etching methods in the study of diffusion through the grain boundaries of metals.

Card : 1/1

GOLIKOV, V. M.

18 18 8 1-4[illegible]

STUDY OF GRAIN BOUNDARY DIFFUSION IN METALS. Presented at the International Conference on Radioisotopes in Scientific Research, Sept. 9-20, 1957 at Paris. No. UNESCO/NS/RIC/47. V. T. Borisov, V. M. Golikov, B. Y. Lyubov, and G. V. Shcherbedinskiy. London, Pergamon Press, Ltd., 1957. 17p.

A method is presented which allows to determine D and D_1 from the data of just one experiment. Comparatively short diffusion annealing is sufficient for its application; besides, the method does not require any infraction of the specimen's entirety. Analysis of kinetic regularities of the diffusion element penetration into the polycrystal allows us to draw some conclusions concerning the theory of applying the autoradiographic method for measuring diffusion parameters. Equations are derived describing the form of the diffusion front near grain boundaries; this allows to make quantitative evaluations of autoradiographic data. (auth)

KURDYUMOV, G.V., otvetstvennyy red.; SAMARIN, A.M., red.; SHVARTSMAN, L.A.,
red.; MALKIN, V.I., red.; GOLIKOV, V.M., red.; RABEZOVA, V.A.,
red.; CHERNOV, A.N., red.izd-va; SIMKINA, Ye.N., tekhn.red.;
KASHINA, P.S., tekhn.red.

[Metallurgy and physical metallurgy proceedings of the Conference on the Use of Radioactive and Stable Isotopes and Radiation in the National Economy and in Science] Metallurgiia i metallovedenie; trudy Vsesoiuznoi nauchno-tekhnicheskoi konferentsii po primeneniiu radioaktivnykh i stabil'nykh izotopov i izluchenii v narodnom khoziaistve i nauke. Moskva, Izd-vo Akad. nauk SSSR, 1958. 518 p.
(MIRA 11:6)

1. Vsesoyuznaya nauchno-tekhnicheskaya konferentsiya po primeneniyu radioaktivnykh i stabil'nykh izotopov i izlucheniì v narodnom khozyaystve i nauke. 1957.
(Metallurgy) (Physical metallurgy)

GOLIKOV, V. M., Cand. Tech. Sci.;

"The Investigation of Boundary and Volume Diffusion by Means of [illegible] Absorption," with Borisov, V. T., Cand. Phys. and Math. Sci.; [illegible], G. V., [illegible].

In [illegible] Problems of [illegible] 1956, Oct. [illegible]

[illegible] investigations [illegible] conducted by the [illegible] Ferrous Metallurgy, [illegible] The investigations were concerned with [illegible] diffusion [illegible] processes, [illegible] conditions.

SOV/[illegible]

Translation from: Referativnyy zhurnal, Metallurgiya, 19[illegible], Nr [illegible], p 2[illegible] (USSR)

AUTHORS: Borisov, V. T., Golikov, V. M., S[illegible], G. V.

TITLE: Investigation of Boundary and Volumetric Diffusion Processes by the Method of Absorption of Beta-radiation (Ob izuchenii pogranichnoy i ob''yemnoy diffuzii metodom pogloshcheniya β-izlucheniya)

PERIODICAL: Sb. tr. In-t metalloved. i fiz. metallov. Tsentr. n.-i. in-t chernoy metallurgii, 1958, Vol 5, pp 383-396

ABSTRACT: A description of experimental apparatus employing radioactive isotopes in studying grain-boundary diffusion processes by the radiation-absorption method. The specimen is maintained in an Ar atmosphere and is heated by means of an alternating current passing through it. An Al filter of a thickness of [illegible] is placed between the specimen and the radiation counter. A method permitting the determination of the coefficient of absorption of β-radiation is presented. The design of an apparatus capable of depositing a radioactive layer by means of spraying is described, and a method for the determination of the thickness of the layer is given.

Card 1/1

M. G.

GOLIKOV V. [illegible]

AUTHOR: Shvartsman, L. A., Doctor of Chemical Sciences. 30-1-13/33

TITLE: The Practice of the Application of Isotopes for Technical Purposes (Iz praktiki primeneniya izotopov v tekhnike).

PERIODICAL: Vestnik AN SSSR, 1958, Vol. 28, Nr 1, pp. 79-83 (USSR)

ABSTRACT: The majority of reports delivered at the Paris Conference in 1957 dealt with problems of metallurgy. The Polish authors T. Mal'kevich and A. Vanatovskiy used the radioactive isotope Fe^{59} for the explanation of the distribution of non-metallic inclusions in a steel block, which got into the liquid metal during casting from the refractory materials. For this purpose iron oxide which was enriched by Fe^{59} was introduced into the raw clay from which the bricks for the lining of the casting device were made. After casting the ingots and blooms were autoradiographed, and besides the radioactive intensity of radiation of the metal was measured. These experiments were also carried out with various refractories in order to determine their influence. The Soviet metal experts V. I. Borisov, V. M. Golikov, B. Ya. Lyubov, and G. V. Shcherbedinskiy in their report dealt with problems of diffusion in real metals, which have a polycrystalline structure. A. A. Zhukhovitskiy, N. Ye. [illegible] and A. D. [illegible] reported on the results of the

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SOV/32-25-9-14/53

5(4)

AUTHORS: Borisov, V. T., Golikov, V. M., Shcherbadinskiy, G. V.

TITLE: On the Determination of the Diffusion-Coefficients in Polycrystals From Concentration Curves

PERIODICAL: Zavodskaya laboratoriya, 1959, Vol 25, Nr 9, pp 1070-1072 (USSR)

ABSTRACT: Only qualitative evaluations of the experimental results obtained can be made since there is no theory as to the influence of the grain boundary on the form of the concentration curves which are obtained with the different variants of the layer analysis method. The present paper describes a method for the determination of the coefficients of the spatial diffusion D and boundary diffusion D_1 from the curves of the γ-radioactivity of the residue. The method may be used in such cases, where γ-radioactive isotopes are used in testing, and the concentration on the surface of the sample is constant during diffusion tempering. By using the scheme of a polycrystal described in a previous paper (Ref 1), equation (1) for the determination of the concentrate of the diffusing element is given. The solution of (1) results according to a suggestion by

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On the Determination of the Diffusion-Coefficients in Polycrystals From Concentration Curves SOV/32-25-9-11/53

Whipple (Ref 2) and the integral radioactivity of the residue is determined according to equation (4). Diagrams are given which were obtained according to the method of the layer removal in the investigation of the autodiffusion of Fe in the alloy Fe-Ni-C by using the isotope Fe^{59} at 900°, and a tempering duration of 37.7 hours. There are 1 figure and 2 references, 1 of which is Soviet.

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (Central Scientific Research Institute of Ferrous Metallurgy)

Card 2/2

5(4)

AUTHORS: Borisov, V. T., Golikov, V. M., Shcherbedinskiy, G. V.

SOV/20-125-4-26/74

TITLE: The Influence of the Consequences of a Phase Transformation Upon Diffusion (Vliyaniye posledstviy fazovogo prevrashcheniya na diffuziyu)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 4, pp 786-789 (USSR)

ABSTRACT: Several papers (Refs 1,2) dealt with the influence exercised by the separating surfaces upon the diffusion rate. According to the results obtained by these investigations diffusion is accelerated if the grains of the polycrystal were crushed by a preceding phase transformation. The present paper intends to carry out a detailed investigation of this phenomenon. The test object used was an iron-nickel alloy: Ni 27.9 %; Si 0.02 %; vestiges of manganese; S 0.01 %; P-vestiges; Al 0.02 %; Cu-vestiges; Fe - the remainder. This alloy was chosen because at room temperature it may be either in the state with austenite structure or in that of martensite structure. In the alloy chosen in this case it is possible to investigate diffusion in austenite with a varying number of intergranular separating

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surfaces. The investigations were carried out by means of the absorption method (Ref 3) with the radioactive iron isotope Fe^{59} serving as diffusing element. For the purpose of determining the diffusion coefficients in the interior and on the boundaries of the grains the kinetic curve is necessary - the dependence of the integral radioactivity of the sample on the duration of diffusion-annealing. The samples of the alloy to be investigated were annealed for 3 hours at 1,200° in order to homogenize them. Immediately after annealing one of the series of samples was immerged in liquid nitrogen for the purpose of producing a martensite structure in them. The other sample retained its austenite structure. After this preliminary treatment a layer of Fe^{59} was sprayed on to the samples of both series in a vacuum, and the samples were then subjected to diffusion annealing in a temperature interval of from 700-1,200°. A diagram shows the original kinetic curves, which had been plotted with their original martensite- and austenite-structure. The radioactivity of the sample subjected to martensite transformation decreases considerably more slowly than

The Influence of the Consequences of a Phase Transformation Upon Diffusion SOV/20-125-4-26/74

that of a sample which had an austenite structure in the initial state. All curves plotted within the temperature interval of from 1,200-800° are of this character. However, at 700° the activity of a sample that had a martensite structure before annealing decreases more rapidly than that of an austenite sample. According to the results obtained by these investigations there is, within a wide interval a difference in the diffusion rate of iron in the samples of an iron-nickel alloy with different pre-treatment. At high temperatures the diffusion coefficients for the samples of both series are practically in agreement. Various possibilities of explaining these phenomena are briefly discussed. According to the authors' opinion, it is most probable that diffusion is slowed down at the separating boundaries which are arranged perpendicular to the front of the diffusion. The authors thank Academician G. V. Kurdyumov for suggesting that this investigation be carried out. There are 3 figures and 5 Soviet references.

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (Central Scientific Research Institute of Ferrous Metallurgy)

Card 3/4

S/126/61/011/005/008/015
E073/E535

AUTHORS: Borisov, V.T., Golikov, V.M. and Shcherbedinskiy, G.V.

TITLE: The Effect of a Separation Boundary on Diffusion in Metals

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.11, No.5, pp.709-713

TEXT: It is well known that the diffusion properties (Ref.1: P. L. Gruzin, E.V. Kuznetsov, G.V. Kurdyumov, DAN SSSR, 1953, 93, No.6) and other properties (Ref.2: Golovchiner, Ya.M., Tyapkin, Yu.D., DAN SSSR, 1953, 93, No.1; Ref.3: Sadovskiy, V.D., Malyshev, K.A., Sazonov, B.G. "Thermally induced transformations in steel") of austenite after a $\gamma \rightarrow \alpha \rightarrow \gamma$ transformation differ from the properties of austenite which has not undergone this transformation. These differences may remain up to temperatures considerably in excess of the temperature of the reverse $\alpha \rightarrow \gamma$ transformation. As a result of these transformations, new separation boundaries appear within the austenite grains and are, in fact, the boundaries of the original martensite crystals. The present authors have investigated the effect of separation boundaries within the austenite grains on

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the self-diffusion of iron in the Fe-Ni (28% Ni) and Fe-Ni-C (29% Ni, 0.5% C) alloys. The coefficients of self-diffusion were determined in specimens subjected to martensitic transformation (series M) and also in specimens which remained austenitic (series A). The measurements were by the kinetic-absorption method and by the layer analysis method, separating volume diffusion from boundary diffusion. The isotope Fe-59 was employed The temperature dependence of the volume diffusion determined by the kinetic-absorption method is plotted in Fig.1 (a - Fe-Ni alloy; б- Fe-Ni-C alloy). In the temperature range 800 to 1100°C, the diffusion coefficients of series M specimens, containing division boundaries additional to those of the series A specimens, were lower, which indicates that the intragranular boundaries have a braking effect The general pattern of the results are in agreement with those obtained by the authors in earlier work using the layer analysis method (Ref.5: Zavodskaya laboratoriya, 1959, No.9) but the values obtained by the kinetic-absorption method are somewhat higher. In earlier work (Ref.6: DAN SSSR, 1959, 125, No 4), the present authors discussed some of the possible causes of the braking

The Effect of a Separation Boundary

S/126/61/011/005/008/015
E073/E535

of the diffusion and it was suggested that the most probable reason for this decrease in D was the presence of separation boundaries oriented perpendicularly to the direction of diffusion. The present paper gives a theoretical analysis of this problem in the case of diffusion of atoms through vacancies. Consider a set of planes X_1; X_2 in a cubic lattice which are parallel to each other and lie at the distance of Δx (Fig 2). Each atom lying on one of the planes has K nearest lattice sites of which K-2k lie in the same plane and k on each of the neighbouring planes. If Δt is the time during which an atom experiences a displacement to one of the two neighbouring planes with a probability 1/2, then it can be shown (Ref 7: S. Chandrasekar "Stochastic problems in physics and astronomy", Russian translation, 1947) that the diffusion coefficient is given by $D = (\Delta x)^2/2\Delta t$. In the case of diffusion through vacancies, the diffusion coefficient can be defined as follows. It is assumed that the probability of displacement to a neighbouring plane is equal to $\beta\Delta t/\tau$, where $\beta = kb$ is the probability for the presence of a vacancy among the k nearest sites, b is the average concentration of vacancies

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The Effect of a Separation Boundary S/126/61/011/005/008/015
E073/E535

within the lattice and $1/\tau$ is the average activation frequency Next, using the condition $\beta\Delta t/\tau = 1/2$, it is found that $\Delta t = \tau/2\beta$ and hence $D = \beta(\Delta x)^2/\tau$ An atom A (Fig.2) which does not lie in the immediate neighbourhood of the separation boundary, undergoes during the time Δt one excursion to the left and one to the right with a probability of 1/2. However on the plane X_1 the excursion to the left during a small time interval Δt_1 occurs with the probability $\alpha = \beta\Delta t_1/\tau$ while the excursion to the right occurs with the probability $\gamma = \beta_1\Delta t_1/\tau$, where $\beta_1 = kb_1$ and b_1 is the concentration of vacancies on the plane which is the separation boundary For simplicity it is assumed that the boundary contains only a single atomic plane having the same coordination numbers K and k as the remainder of the lattice. An atom reaching the plane X_1 remains at rest during a time $\Delta t_1 = \tau/(\beta + \beta_1)$, which is determined by the condition $\alpha + \gamma = 1$. The time Δt_1 is N times smaller than Δt and $N = \Delta t/\Delta t_1 = (1 + \beta_1/\beta)/2$. The authors then determine the path of the particle which has undergone the transition $X_2 \rightarrow X_1$ towards

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the end of an interval Δt [illegible] the end of the next interval [illegible] process occurs in N steps. If [illegible] a $X_1 \to X_0$ transition, then the [illegible] on the X_1^0 plane is [illegible](K − 1), while the [illegible] atom to reach the energy sufficient for [illegible] next jump (activation time) is τ_1, where $1/\tau_1$ is [illegible] frequency on the separation boundary. [illegible] i.e. the vacancy does not succeed in [illegible] τ_1, it follows that the probability that the atom will be reflected from the separation boundary will be $\alpha_1 = t_0/\tau_1 = 1/(1 + \beta)$, while the probability that the atom will pass through the boundary is $\gamma_1 = \beta t_0/\tau_1 = \beta/(1 + \beta)$, where t_0 is the lifetime of the atom on the boundary and is much less than τ_1. The authors then determine the probabilities p and q that the particle reaching X_1 from X_2 will return to X_1 and that it will reach X_{-2} during the time interval Δt. It is shown that these two probabilities are given by:

$$p = [illegible] \qquad (1)$$

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$$q = \frac{z}{2}\sum_{n=0}^{N-1}\left[\ldots - \left(\ldots\right)^{n}\right] \qquad (2)$$

The first expression holds when $\tau_1 \ll t$. Using the method described by Chandrasekar, it is then shown that the concentration of the diffusing atoms at a point on the separation boundary is given by

$$C(x,t) = (1-z)C_0(x,t) + \int_0^t C_0(x,\tau)\,g(t-\tau)\,d\tau \qquad (3)$$

where $C_0(x,t)$ is the concentration at this point in the absence of the separation boundary and $g(t)$ is a function whose Laplace-Carson representation is

$$g(p) = p\left\{\left[1 - \frac{z}{1-z}\left(1-\exp(-2p\Delta t)\right)^{1/2}\right]^{-1} - (1-z)\right\}. \qquad (4)$$

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As can be seen from Eq.(5), the presence of the boundary leads to a reduction in the diffusion and the appearance of additional sources whose density is g(t). Thus, the effect of the separation boundary as determined by this simplified analysis is in qualitative agreement with experimental data. For a quantitative description it is necessary to take into consideration the effect of a large number of successively distributed boundaries of blocks and grains. It is likely that the larger the number of boundaries intersected by the diffusing atom, the larger will be their total braking effect. Therefore, during a decrease in temperature when the depth of the diffusion penetration decreases, the braking on transverse boundaries weakens and becomes suppressed as a result of acceleration of the diffusion on acount of longitudinally distributed boundaries. In the described experiments this occurred at about 700°C. A cessation of the braking effect in the range of high temperatures is attributed to a development of processes of relaxation in the structure, which led to a cessation of additional division boundaries in the specimens of the M-series In the work of some authors an increase of the average diffusion

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coefficient was observed with decreasing grain size. Apparently in such a case the depth of the diffusion zone is commensurate with the grain size and the accelerating effect of the longitudinal boundaries prevails over the decelerating effect of the transverse boundaries. There are 3 figures, 1 table and 9 references: all Soviet.

ASSOCIATION: Institut metallovedeniya i fiziki metallov TsNIIChM (Institute of Metal Science and Physics of Metals TsNIIChM)

SUBMITTED: June 23, 1960 (initially)
October 6, 1960 (after revision)

Card 8/9

BORISOV, V.T., kand.fiziko-matematicheskikh nauk; GOLIKOV, V.M., kand.tekhn. nauk; SHCHERBEDINSKIY, G.V., kand.fiziko-matematicheskikh nauk

Effect of the interface on diffusion in polycrystals. Probl. metalloved.i fiz.met. no.7:501-521 '62. (MIRA 15:5)
(Metal crystals) (Diffusion)

S/020/63/149/006/012/027

L 16970-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD

AUTHOR: Borisov, V. T., Golikov, V. M., and Shcherbedinskiy, G. V. 56

TITLE: Statistical calculation of the self-diffusion coefficient in metals

76

PERIODICAL: Akademiya nauk SSSR. Doklady. v. 149, no. 6, 1963, 1307-1310

TEXT: The analysis of experimental results on the basis of the formula of diffusion coefficients provided by the theory of absolute reaction rates does not make it possible to directly associate the values of the preexponential factor and activation energy with some definite physical characteristics of a substance. This is achieved by more detailed analysis of activated state on the basis of a suitable model or a statistical calculation. Therefore, the authors describe a statistical examination of self-diffusion of atoms over the vacancies or positions of penetration in pure metals or weak solutions. A formula for the equilibrium concentration of vacancies is presented. It is found that the coefficient of diffusion over the vacancies does not explicitly depend on the characteristics of vacancies in equilibrium state but is determined by the potential energy and normal frequencies of activated state. There are 2 figures.

ASSOCIATION: Institut metallovedeniya i fiziki metallov Tsentral'nogo nauchno-issledovatel'skogo instituta chernoy metallurgii im. I. P. Bardina (Institute of Metallography and Metal Physics, Central Scientific Research Institute of Ferrous Metallurgy imeni I. P. Bardin)

SUBMITTED: December 4, 1962

Card 1/1

L 23474-65 EWT(m)/T/EWP(t)/EWP(b) JD

ACCESSION NR: AP4043924 S/0279/64/000/004/0147/0152

AUTHOR: Borisov, V. T. (Moscow); Golikov, V. M. (Moscow); Dubinin, G. N. (Moscow)

TITLE: The determination of the diffusion coefficient in alloys in the presence of several phases

18

SOURCE: AN SSSR. Izv. Metallurgiya i gornoye delo, no. 4, 1954, 147-152 B

TOPIC TAGS: chromium diffusion, iron, chromizing, multiphase medium, diffusion coefficient, diffusion coating

18

ABSTRACT: Despite the extensive information available on the diffusion coating of alloy surfaces with metals and metalloids, insufficient attention has been paid to the computation of the diffusion constant in thermochemical treatment. The authors propose a method of determining the diffusion coefficient for the case in which a multiphase diffusion layer forms on the surface zones of the impregnated metal. For that purpose iron specimens containing 0.03% C were chromized at 900, 1000, 1100, and 1200C for 3 and 6 hours (see Fig. 1 of the Enclosure). The concentration of Cr in each surface layer was determined by spectral analysis. The authors arrived at the following equation describing the diffusion coefficient:

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L 23474-65

ACCESSION NR: AP4043924

0

$$4D_1t = y_1^2/\ln\left(\frac{m_0}{m_1 + c_1y_1}\right)$$

Orig. art. has: 15 equations and 3 figures.

ASSOCIATION: none

SUBMITTED: 07Oct63 ENCL: 01 SUB CODE: MM

NO REF SOV: 011 OTHER: 004

Card 2/3

L 23474-65

0

ACCESSION NR: AP4043924

ENCLOSURE: 01

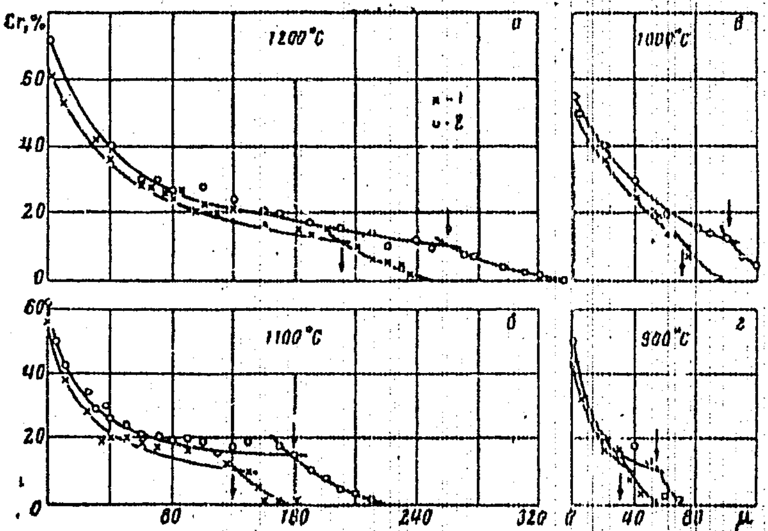

Fig.1.: Changes in the Cr concentration in the surface layers of iron impregnated with Cr from a gaseous environment at 900 to 1200C for (1) three and (2) six hours

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L 16450-65 EWT(1) ESD(gs)/SSD/AFWL/ASD(m)-3

ACCESSION NR: AP4042046 S/0126/64/017/006/0881/0885

AUTHOR: Borisov, V. T.; Golikov, V. M./ Shcherbedinskiy, G. V. 3

TITLE: The relationship between diffusion 2 coefficients and grain boundary energy

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 6, 1964, 881-885

TOPIC TAGS: atomic mobility, B F alloy, surface energy, nuclei formation, volumetric diffusion, lattice vacancy, B redistribution

ABSTRACT: Few data are available on the surface energy of grain boundaries. Therefore, the authors carried out a study of the relationship between volumetric and boundary diffusion and boundary energy. The considerably higher atomic mobility at grain boundaries as compared to the grain itself may be attributed to the excessive concentration of vacancies and low activation energy. The authors studied the selfdiffusion of Fe in an Fe-B alloy (other additives were C -- 0.001; Si -- 0.01; S -- 0.001 and P -- 0.01%). Boron did not appreciably affect volumetric diffusion of iron but inhibited boundary diffusion. Rising temperatures lowered the effect of B. Experimental values of volumetric and boundary diffusion provided the calculation of boundary energy at different temperatures. The authors

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L 16450-65
ACCESSION NR: AP4042046

consider the redistribution of boron between the grain and the boundary. They contend that the solubility of B in Fe being very low, the B atoms occupy the defective sites in the crystal lattice. Consequently, they argue, boron solubility depends on the concentration of defects. Boundaries are depleted of boron and the subsequent increase in the concentration of boundary vacancies may lead to nuclei formation of a new phase and lower the stability of austenite. Orig. art. has: 3 figures and 1 table.

ASSOCIATION: Institut metallovedeniya i fiziki metallov TsNIIChM (Institute of Metallography and Metal Physics, Central Scientific Research Institute of Ferrous Metallurgy)

SUBMITTED: 12Dec62

ENCL: 01

SUB CODE: MM

NO REF SOV: 004

OTHER: 004

Card 2/3

L 16450-65

ACCESSION NR: AP4042046

ENCLOSURE: 01

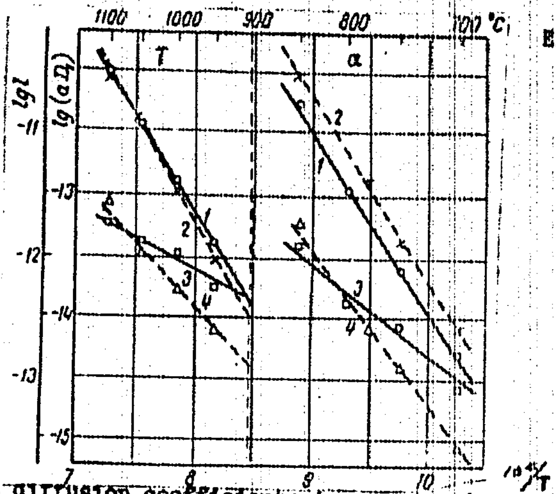

Fig. 1. Temperature versus diffusion coefficients in α- and γ- phases: (1) volumetric selfdiffusion of Fe; (2) volumetric Fe diffusion in the Fe-B alloy; (3) boundary selfdiffusion of Fe; (4) boundary Fe diffusion in the Fe-B alloy

Card 3/3

BORISOV, V.T.; GOLIKOV, V.M.; SAVILOV, Ye.S.; SHCHERBEDINSKIY, G.V.

Studying the diffusion of carbon in iron. Probl. metalloved. i fiz. met. no.8:305-310 '64. (MIRA 18:7)

L 62921-65 EWT(1)/EWT(m)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b)/EWA(h) IJP(c)
JD/JG

ACCESSION NR: AP5018857 UR/0126/65/020/001/0069/0077
539.219.3

36
31
B

AUTHOR: Borisov, V. T.; Golikov, V. M.; Dubinin, G. N.
44, 55 44, 55

TITLE: Kinetics of diffusion in binary systems with several phases
18

SOURCE: Fizika metallov i metallovedeniye, v. 20, no. 1, 1965, 69-77
14

TOPIC TAGS: metal diffusion, solid solution, chromium steel, binary alloy, metal phase system
44, 55

ABSTRACT: Several theoretical methods for determining the coefficient of diffusion and the thickness of phase layers are presented for binary systems. No experimental work is done and the analysis is mathematical in nature. Both exact and approximate methods are presented for the determination of the above parameters, the method used being dependent upon the known conditions of the system. Specific formulas and methods for calculation of the diffusion coefficient are given for the following cases: (1) when the distribution of the diffusing material is known to a great degree of accuracy and graphical differentiation is possible; (2) when the concentration distribution is known well enough that integral diffusion fluxes can be de-

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ACCESSION NR: AP5018857

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termined; (3) when the thickness of the phase layer is known, when there is very little or no mutual solid solubility of the two components, and when the concentration of the diffusing element does not change through the phase layer. An example is given for diffusion of chromium into steel. This example falls into category (3) above. Orig. art. has: 4 figures, 20 formulas.

ASSOCIATION: Institut metallovedeniya i fiziki metallov (Institute of Metal Science and Physics of Metals); TsNIIChM im. I. P. Bardina; Moskovskyy aviatsionnyy institut, im. S. Ordzhonikidze (Moscow Aviation Institute)

SUBMITTED: 16Mar64 ENCL: 00 SUB CODE: MM

NO REF SOV: 005 OTHER: 001

dm

Card 2/2

GOLIKOV, V.M.; BORISOV, V.T.; [illegible]

All-Union scientific conference on diffusion in metals and alloys. Metalloved. i term. obr. met. no.2:58-61 F '65.
(MIRA 18:12)

[illegible] EWT(m)/EWP(t)/ETI IJP(c) [illegible]/JD/[illegible]
ACC NR: AP6027601 SOURCE CODE: UR/0126/66/022/001/0159/0160

AUTHOR: Borisov, V. T.; Golikov, V. M.; Shcherbedinskiy, G. V.

37

ORG: TsNIIChERMET im. I. P. Bardin

TITLE: Diffusion of molybdenum in iron and in an iron-molybdenum alloy

SOURCE: Fizika metallov i metallovedeniye, v. 22, no. 1, 1966, 159-160

TOPIC TAGS: metal diffusion, molybdenum, surface active agent, molybdenum containing alloy

ABSTRACT: It is of interest to investigate the diffusion of a surface-active component in an alloy already containing the same component. Theory indicates that for surface-active substances, under the conditions of a thermodynamic equilibrium, the coefficients of volume diffusion and diffusion along grain boundaries should not markedly differ from each other. If, on the other hand, the component diffuses through a pure solvent, it chiefly penetrates along the grain boundaries. Therefore, if the concentration of the active element is increased (to its equilibrium value), its mobility along the grain boundaries must decrease. Mo is a surface-active element with respect to Fe. In this connection, the authors investigated the diffusion

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L 09020-67

ACC NR: AP6027801

of Mo (i.e. of the radioactive isotope Mo^{96}, electrolytically deposited on the surface of specimens) in polycrystalline specimens (with nearly uniform grain size: 5-10 μ) of pure Fe and Fe-Mo (0.7% Mo) alloy. The mean diffusion coefficient D_{av}, averaged for both volume diffusion and diffusion along grain boundaries, was determined by laminar analysis, while the coefficients for volume diffusion D_{vol} and diffusion along grain boundaries were separately determined by the absorption-kinetic method. Findings: for diffusion of Mo in pure Fe: D_{av} = 0.3 exp (-49,000/RT), and $D_{vol} = 7.8 \cdot 10^{3}$ exp (-73,000/RT). For diffusion of Mo in Fe-Mo alloy: $D_{av} = 2.24 \cdot 10^{2}$ exp (-61,000/RT) and $D_{vol} = 1.3 \cdot 10^{1}$ exp (-75,000/RT). The temperature dependence of D_{av} and D_{vol} (Fig. 1) indicates that the values of D_{av}, determined by laminar analysis, are higher, and the activation energy is lower, compared with the corresponding characteristics for purely volume diffusion. This is associated with the effect of grain boundaries, which is much smaller in the case of the Fe-Mo alloy. And indeed, the findings obtained by the absorption method indicate that, while activation energy and D_{vol} are similar in both pure Fe and in Fe-Mo alloy, the mobility of Mo atoms along grain boundaries is higher in pure Fe than in the Fe-Mo alloy. These findings confirm the above reasoning on the effect of surface-active elements.

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L 09020-67
ACC NR: AP6027801

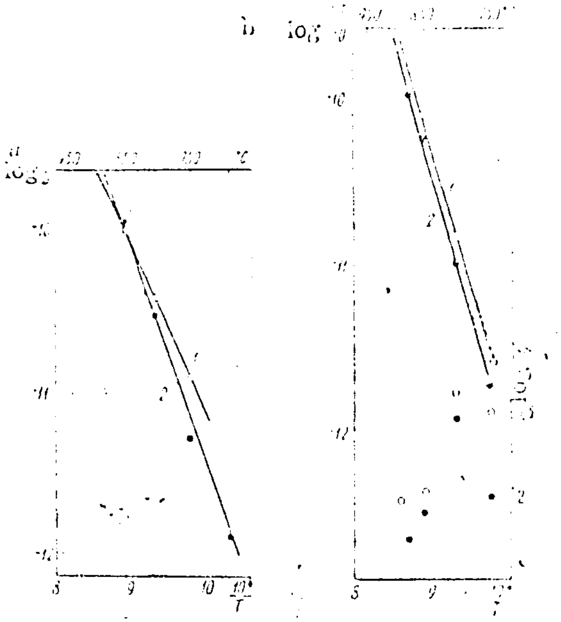

Fig. 1. Temperature dependence of D_{av} (a) and D_{vol} (b) for molybdenum;

1 - pure Fe; 2 - Fe-Mo; 2a - width of intergranular layer; $\delta = D_l/D$ (D_l is the coefficient of diffusion along grain boundaries).

SUB CODE: 11, 20/ SUBM DATE: 26Jun65/ ORIG REF: 004/ OTH REF: 001

Card 3/3 nst